

- c. pouring a molten casing alloy into the heated mold,
- d. lowering the mold with the molten alloy into a cooling zone comprising a tank having an open upper portion and a closed bottom portion with water-cooled walls extending therebetween, the open upper portion being immediately adjacent to the heating zone; and
- e. solidifying the molten alloy by radiation cooling onto the water-cooled wall of the tank to form the metal casting.

Please add new claims 15 to 25 as follows.

- 15. The method of claim 9 wherein the tank has a truncated cross-sectional with the bottom portion having a smaller base than the upper portion.
- 16. The method of claim 9 wherein the mold has a starter cavity for a crystal having a defined crystal orientation.
- 17. The method of claim 9 wherein the tank has a double layer wall.
- 18. The method of claim 9 wherein the tank is made of stainless steel.
- 19. The method of claim 9 wherein the mold is made of a ceramic.
- 20. The method of claim 9 wherein the mold and the furnace are disposed in a vacuum chamber.
- 21. The method of claim 9 wherein the furnace comprises a preheating furnace and an induction furnace.

22. A method of making a metal casting comprising the steps of:
- a. placing a casting alloy into a furnace having a preheater in a vacuum chamber;
 - b. lowering the alloy into the preheating furnace;
 - c. evacuating the vacuum chamber;
 - d. heating the alloy to a temperature of about 100 to 150 °C above a liquidus temperature of the alloy to provide a molten alloy;
 - e. providing a heating furnace to heat the mold; the heating furnace having a heating zone;
 - f. pouring molten alloy into the heated mold;
 - g. disposing a baffle under the heating zone;
 - h. lowering the mold with the molten alloy into a cooling zone comprising a tank having an open upper portion and a closed bottom portion with water-cooled walls extending therebetween, the open upper portion being immediately adjacent to the heating zone;
 - i. turning off the preheater and the furnace heater;
 - j. solidifying the molten alloy by radiation cooling onto the water-cooled wall of the tank until the temperature is decreased to 300-400° C;
 - k. decompressing the vacuum chamber; and
 - l. extracting the solidified metal casting.

23. The method of claim 22 wherein the mold has a starter cavity for a crystal having a defined crystal orientation.

24. The method of claim 22 wherein the tank has a truncated cross-sectional with the bottom portion having a smaller base than the upper portion.

RD-25712
09/319.906

25. The method of claim 22 wherein the mold has a starter cavity for a crystal having a defined crystal orientation.